Eco-sustainable routing in optical networks - DTU Orbit (09/11/2017)

Eco-sustainable routing in optical networks

It is quite easy to foresee that in the next years, the future generation ultra-high speed network infrastructures and equipments will be no longer constrained only by their pure transport capacity, but also by their energy consumption costs and environmental eects. In particular, large network infrastructures are now widely recognized to play a fundamental role in the emission of green-house gases (GHG) in the at- mosphere, signicantly aecting the environmental sustainability of new evolutions in network architectures as well as technological developments in communication devices. In this paper, a novel eco-sustainable Routing and Wavelength Assignment (RWA) algorithm, based on shortest-path routing with an adaptive link weighting function relying on an extension of the OSPF-TE protocol to convey carbon footprint information, has been proposed to decrease the network ecological impact while balancing the trac load and maintaining acceptable connection blocking rate. The trade-o between load balancing and carbon footprint is also analyzed to evaluate the eectiveness of the proposed strategy within the context of a real world network.

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